What is claimed is:

1. A process for operating on a dataset, comprising:

defining a plurality of slicing planes through the dataset, said slicing planes being parallel to a viewing plane;

interpolating density values in normalized device space for the figures generated by the intersection of the dataset with the slicing planes; and

storing the density values for later use.

2. The process of claim 1 wherein said step of interpolating includes the step of rasterizing the figures generated by the intersection of the dataset with the slicing planes.

3. The process of claim 1 wherein said step of interpolating includes the step of interpolating a density value by analyzing the density values assigned to a predetermined number of nearby points.

4. The process of claim 1 additionally comprising the step of transforming the dataset to a new viewing plane.

5. A process for operating on a volumetric dataset, comprising:

selecting a viewing plane;

slicing the dataset into a plurality of two dimensional slices, each slice resulting in a geometric primitive parallel to said viewing plane;

converting each primitive to a set of fragments each having its own three dimensional texture coordinate;

determining the density value of the three dimensional texture coordinate through interpolation from the nearest neighbors, and

storing the density values for later use.

6. The process of claim 5 wherein said step of converting includes the step of trilinear interpolation.

7. The process of claim 5 additionally comprising the step of transforming the dataset to correspond to the viewing plane.

8. A method of preprocessing a 3 D dataset, comprising:

dividing the 3D dataset into a plurality of 2D primitives;

calculating density textures for each of said plurality of 2D primitives; and

storing said density textures for later use.

9. The method of claim 8 wherein said step of calculating the density textures includes the step of rasterizing said plurality of 2D primitives.

10. The method of claim 8 wherein said step of calculating includes the step of interpolating a value by analyzing the values assigned to a predetermined number of nearby points.

11. The method of claim 8 additionally comprising the step of transforming the dataset to a new viewing plane.

12. A process for operating on a 3D volumetric dataset, comprising:

defining a plurality of slicing planes through the dataset, said slicing planes being parallel to a viewing plane, the intersection of each of said slicing planes with said dataset producing a primitive;

rasterizing each of said plurality of primitives; and

storing the values produced by the rasterizing step for later use.

13. The process of claim 12 wherein the values produced by the rasterizing step include density textures which are stored without transformation.

14. The process of claim 12 additionally comprising the step of transforming the dataset to a new viewing plane.

15. A process, comprising:

operating a rendering pipeline on a volumetric dataset in a feedback mode to prevent the rendering of the dataset; and

storing the results produced by the feedback mode of operation for later use in a rendering operation such that the later rendering operation is reduced to a compositing problem.

16. A method of rendering a volumetric dataset, comprising:

retrieving information from a lookup table indicating a contribution to an image;

compositing the retrieved information; and

displaying the composited information.

17. The method of claim 16 wherein the information includes values for red, green, and blue and an opacity value.

18. The method of claim 17 wherein the retrieving step includes the step of using a density- texture as a pointer to the information in the table.

19. A method of rendering a volumetric dataset, comprising:

using texture values as pointers for retrieving information from a lookup table;

compositing the retrieved information; and

displaying the composited information.

20. The method of claim 19 additionally comprising the step of transforming the density texture values into normalized-device space prior to using the density texture values as pointers.

21. The method of claim 19 wherein the information includes values for red, green, and blue and an opacity value.

22. A method of rendering a volumetric dataset, comprising:

compositing information from a lookup table.

23. The method of claim 22 wherein the information includes values for red, green, and blue and an opacity value.

24. The method of claim 22 additionally comprising the step of using a density- texture as a pointer to the information in the table.